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(54) Title: **MAGNETIC RESONANCE IMAGING APPARATUS AND METHOD**

(57) **Abstract:** The present invention relates to a magnetic resonance imaging apparatus comprising an RF coil system comprising M RF coils (11-18) for detecting RF signals from a region of interest, M being an integer larger than 2, and N receiver channels (C1-C4) for receiving and processing the detected RF signals, N being an integer larger than 1 and smaller than M. According to the invention at least two RF coils (12, 16; 14, 18) are combined for reception of RF signals of said RF coils with a single receiver channel, wherein said at least two RF coils are selected so as to provide maximum spatially varying coil sensitivities along the principal axis for coil sensitivity encoding. The proposed MRI apparatus provides an optimal solution enabling it to be used with the SENSE method. The general idea is to have as much individuality as possible along the preferred or actual sense reduction direction and to feature as much spatial distinctness as possible along the axes of primary clinical interest.

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